

CLAIMS

1. A system for forming a metal film on a substrate comprising:
a deposition chamber; and
a coil comprised of a first metal and having opposite terminal ends disposed within the deposition chamber;
wherein at least one of the opposite terminal ends is angled less than ninety degrees.
2. The system of claim 1 wherein the at least one opposite terminal end is forty-five degrees.
3. The system of claim 1 wherein the coil defines a plane and at least a portion of at least one opposite terminal end is non-perpendicular to the plane.
4. The system of claim 1 further comprising a target disposed within the deposition chamber wherein the target is comprised of a second metal.
5. The system of claim 1 wherein the metal film has a thickness less than 500nm.
6. The system of claim 4 wherein the first and second metals include the same metal material.
7. The system of claim 1 wherein the coil is of a diameter greater than or equal to 300mm.
8. The system of claim 1 wherein the coil is non-circular.

9. A method for forming a metal film on a substrate comprising:

positioning a coil in a deposition chamber, the coil comprising a first metal and having opposite terminal ends, wherein at least one of the opposite terminal ends is angled less than ninety degrees;

providing a radio frequency (RF) power to the coil to produce an electric field that is relatively uniform across the coil; and

sputtering portions from a target comprising a second metal through the coil and onto the substrate.
10. The method of claim 9 wherein coil defines a plane and at least a portion of at least one opposite terminal end is non-perpendicular to the plane.
11. The method of claim 9 wherein the relatively uniform electric field produces a film thickness that varies by 5% or less across the substrate.
12. The method of claim 9 wherein the metal film has a thickness less than 500nm.
13. The method of claim 9 wherein the first and second metals include the same metal material.
14. The method of claim 9 wherein the coil is of a diameter greater than or equal to 300mm.
15. An ionized metal plasma system for sputtering a metal film onto a wafer, the system comprising:

a target source comprising a first metal;

a chuck for securing the wafer;

at least one coil positioned between the target source and the chuck, the at least one coil being formed of a contiguous band of a first metal except for a relatively small gap in the band, the coil defining a transverse axis and the gap is non-aligned with the axis.

16. The system of claim 15 wherein the metal film has a thickness less than 500nm.

17. The system of claim 15 wherein the first and second metals include the same metal material.

18. The system of claim 15 wherein the coil is of a diameter greater than or equal to 300mm.

19. A system for forming a metal film on a substrate comprising:

a deposition chamber;

a power supply for providing a radio frequency power; and

a solid and contiguous coil disposed within the deposition chamber; /

wherein the coil is connected to a single power terminal of the power supply.